

FOODS FROM THE TANOAK FOREST ECOSYSTEM

BONNIE NIELSEN AND JANICE ALEXANDER

University of California Cooperative Extension, Marin County, 1682 Novato Blvd.,
Suite 150B, Novato, CA 94947
banielsen@ucdavis.edu

ABSTRACT

This paper offers a modern take on wild edible plants of the tanoak, *Notholithocarpus densiflorus* (Hook. & Arn.) Manos, Cannon & S. H. Oh (Fagaceae), ecosystem with instructions for gathering materials and preparing foods. We review the collection and processing of acorns, bay nuts, and foliage for herbal teas, along with specific recipes.

Key Words: Acorns, edible plants, medicinal tea, tanoak, wild foods.

The tanoak, *Notholithocarpus densiflorus* (Hook. & Arn.) Manos, Cannon & S. H. Oh (Fagaceae), ecosystem has produced an abundance of food for wildlife and native people for millennia. The recent resurgence in foraging for edible wild plants boasts potential benefits to the health of people as well as our planet. As described by Andler and Feinstein (2011), wild plants are the most natural, whole food one can eat, and generally more nutritious in terms of vitamins, minerals, and antioxidants—all those micronutrients that the plants develop in order to protect their own health in the absence of chemical fertilizers, pesticides, and genetically modified seed. Moreover, eating local wild plants can contribute to a more sustainable food system by cutting back on water usage and transportation costs, as well as not requiring the levels of outside inputs that modern agriculture relies upon (Andler and Feinstein 2011).

When collecting wild foods, caution is needed; there is a definite distinction between contributing to a more sustainable food system and depleting a resource. Sustainable harvesting techniques need to be practiced whenever harvesting wild edibles. Some general guidelines include harvesting a plant if it is clearly growing in abundance and only harvesting up to a third of that plant's entire mass (Andler and Feinstein 2011). In addition, traveling through different forests, potentially off-trail and in sensitive areas, requires great care so as not to inadvertently spread insects, pathogens, and weeds. Following simple sanitation techniques (COMTF 2006) to reduce the spread of these pests will help keep our forests free of damaging invasive species. A full set of gathering ethics can be found in Peters and Ortiz (2010).

Following is a modern take on gathering and preparing wild edible plants of the tanoak ecosystem.

ACORNS: FROM TREE TO TABLE

A mature oak (*Quercus* spp. as well as tanoak, *Notholithocarpus densiflorus*) can produce almost

1000 pounds of acorns in one growing season during normal weather conditions in a good year—which usually occurs every four to five years (Ortiz 1991). Acorns made up half of the diet of many native Californians (Heizer and Elasser 1980), and local native elders prized tanoak and black oak acorns especially for their flavor and nutritional value (Peters and Ortiz 2010). Acorns are high in fiber, low in sugar, lower in fat than most nuts, and are noted for controlling blood sugar levels and maintaining a healthy body weight. A reliable source of carbohydrates, protein, 6 vitamins, 8 minerals, and 18 amino acids, acorns are more carbohydrate than protein, and functionally more like a grain than a nut (Andler and Feinstein 2011). They have a sweet, mildly nutty flavor when properly prepared. Acorn flour may be used in bread recipes, substituting acorn flour for approximately 1/4-1/2 of the wheat flour. Acorn meal can be used in place of nuts in cookie, brownie, and bread recipes, and in place of corn meal in most recipes (Bainbridge 1986).

Acorns have high levels of tannins which need to be removed before human consumption, as they are toxic to humans in large amounts (Clay 2003; Andler and Feinstein 2011). While different oak species contain varying levels of tannins, virtually all of the acorns eaten by native Californians contain high enough levels of tannins to require leaching.

General Guidelines for Processing Acorns

Depending on location, type of acorn, materials accessible, and personal practice, many variations in acorn processing methods exist. We refer to “Acorns and Eat ‘Em” (Ocean 2001) for the following guidelines, and suggest further research and individual experimentation with acorn processing to create a personal processing practice that works best for those interested. Below are some general guidelines.

1. **Harvesting acorns:** Acorns can be harvested as soon as possible after the second crop of the season falls off an oak tree. The first fall consists largely of worm- and insect-infested acorns, and is not suitable for use. The second fall consists of healthy nuts brought down by wind usually in late September and October (Ortiz 1991). Acorns for collection may be green, green and tan, or brown. Although the green nuts aren't fully ripe, they will continue to ripen and turn dark brown in a few days.
2. **Drying:** Spread acorns on a tray or screen. Discard any acorns with signs of mold or worm holes. Dry the acorns either in direct sunlight for 2–5 consecutive days or in a warm 175°F oven for 20 min with the oven door slightly ajar to allow moisture to escape. You can also dry acorns in a box in a warm area (e.g., near a stove) over the course of a month, as long as you regularly stir them to prevent mold development (Peters and Ortiz 2010).
3. **Storage:** After reinspection for mold or holes, store dried acorns in a cool dry place out of direct sunlight. Acorns can keep for several years if properly stored. A variety of storage containers may be used, ranging from burlap sacks to kitchen bowls or jars; there is a general consensus to avoid plastic since they may pick up plastic flavors.
4. **Opening the outer shell:** Remove the acorn nutmeats from their outer shells when you are ready to process and eat them. Crack the thin outer shell with a nutcracker. Peel it off, saving the inner nutmeat, which can then be processed either whole or ground into a coarse meal.
5. **Leaching:** Acorns have reportedly been leached by a variety of methods. Whichever you choose, it is important to taste a small amount to determine if the tannic acid has been sufficiently removed—it should taste sweet and may require more leaching if still bitter. Acorns may be leached by placing in hot water for an hour, draining, and repeating the process a few times; by flushing with running, cold water continually for several hours; or by soaking in water that is changed daily for a week. All these methods remove the water-soluble tannic acid. Ocean (2001) recommends the third method, blending the acorns first with water in a ratio of 3 parts water to 1 part acorns, and then placing the mixture in large jars in the refrigerator, where the meal will settle to the bottom. Each day, pour off the water darkened by the tannins and add fresh water.
6. **Using processed nuts:** Once leached, the damp acorn nutmeat may be used in a variety of recipes, or dried (either by the

sun or in an oven) for later use. Pound or grind dried nutmeats to desired consistency. Acorn grits and flour will keep in a sealed container for several weeks in a refrigerator or several months in a freezer. Since it contains oil, ground meal will turn rancid if left in a warm environment. Whole acorns dried in the shell may last for several years.

CALIFORNIA BAY LAUREL: LOCAL COFFEE-CHOCOLATE

The nuts of the California bay laurel, *Umbellularia californica* (Hook. & Arn.) Nutt. (Lauraceae), are edible when roasted and have long been consumed by California tribes as a condiment, digestive aid, and stimulant. Many people would eat bay nuts in spring or fall to ready the body for seasonal changes (Ander and Feinstein 2011). Plain bay nuts taste like a cross between a coffee bean and cacao bean, and are quite pleasant mixed with a little sweetener such as honey or agave nectar. You can also grind the nuts in a coffee grinder and steep the powder in hot water to make a cross between coffee and hot chocolate (again, this is recommended sweetened) or use the powder as you would cacao powder. Bay nuts contain a chemical constituent similar to caffeine; their stimulating effects have been described as edgier than caffeine, but shorter lived (K. Feinstein, naturalist, personal communication). The nuts contain 40–60% of a waxy fat which behaves very much like cocoa butter (K. Feinstein, personal communication).

Processing Bay Nuts Step-by-Step

1. **Harvesting.** Bay nuts are harvested in the fall (October through November), when they drop from the trees. Select nuts that have not sat on the ground too long, judging by the condition of the fleshy outer husk.
2. **Peeling.** Peel off the outer fruit from the nuts soon after harvesting, before the variously colored fleshy coatings begin to wither and rot (Fig. 1). When fully ripe, just as the outside begins to turn purple, the fruit may be eaten like an avocado, but the window is quite narrow between unripe (bitter) and overripe (rotten), and usually the fruit must be discarded.
3. **Drying.** Dry the peeled nuts in their shells on a baking sheet in the oven at 350°F for about 10–15 minutes—or until they start to crack open. The nuts can keep for about a year once fully dried (Peters and Ortiz 2010).
4. **Roasting.** Crack the shells open with a nutcracker. Inside you will find the near-translucent, beige-colored nutmeats that easily break in half, similar to peanuts. Place the



FIG. 1. Peeled bay fruit reveals the nut inside.

nutmeats on baking sheets roast for 30–45 minutes at 350°F, stirring occasionally—approximately every ten minutes. If roasting at higher temperatures, up to 450°F, you may need to stir them every few minutes. Bay nuts can cross from underdone to overdone quickly, and should be checked frequently. The bay nuts will turn darker shades of brown, from tan to the color of milk chocolate to dark chocolate, and eventually to a black-brown (overdone); a tasty roasted bay nut is a dark chocolate brown. The essential oils remaining in bay nuts that have not been roasted long enough make them pungent and inedible, whereas if roasted until too dark, the nuts become bitter and reminiscent of charcoal. Remove from the oven as soon as the average nut is similar in color, approximately the shade of coffee with cream.

5. Storage. Roasted bay nuts can be stored in an airtight container at room temperature for several months.
6. To serve. Mix roasted nuts with local honey (such as tanoak honey, if available) and a sprinkling of sea salt.

HERBAL MEDICINES: DOUGLAS-FIR AND YERBA BUENA TEAS

Douglas-Fir

The young shoot tips of Douglas-fir, *Pseudotsuga menziesii* (Mirb.) Franco (Pinaceae), have a subtle woody, slightly astringent flavor, and can be eaten raw. They have also been used as a flavoring in cooked foods. A refreshing tea is made from either the young or mature needles that is rich in vitamin C and has been used in the treatment of colds. It is said to have expectorant

qualities as well (The Living Wild Project 2011) and has been used as an inhalant in steam baths.

To make Douglas-fir tea, harvest the bright green needle tips in the springtime—March through May. The darker mature needles may be used as well, and have a slightly more potent flavor. Remove the needles from the stems and finely chop or thoroughly bruise them, to release the essential oils. Alternatively, dry the needles to store for later use. Steep the needles in boiling water for 15–30 minutes, strain, and serve.

Yerba Buena

Native to North America, yerba Buena, *Clinopodium douglasii* (Benth.) Kuntze (Lamiaceae), is a common ground-cover in tanoak ecosystems. Yerba buena has been used medicinally for centuries; its positive health effects inspired Spanish colonizers to refer to it as the “good herb” or “*yerba buena*.” A member of the mint family, it shares many of the medicinal qualities of other mints, including the ability to counteract harmful microbes. Yerba buena tea is used to treat coughs and colds due to its expectorant qualities and as a digestive aid (Peters and Ortiz 2010). Due to its analgesic qualities, direct application of the herb as well as the juice from crushed leaves is used as a pain reliever for headaches, toothaches, and insect bites (Medicalhealthguide.com 2012).

Yerba buena tea can be made from either fresh or dry leaves. Dry the leaves on a tray for a few weeks in a warm dry area, or in a dehydrator. Steep fresh or dry leaves in boiling water for up to 30 min.

ACKNOWLEDGMENTS

The recipes outlined in this paper were used to create an exhibit of native plant foods at the “Tanoak Wild” session of the Fifth Sudden Oak Death Science

Symposium in Petaluma, CA on June 22, 2012. Participants were able to view the foods at different stages of processing (i.e., whole nuts, ground flour, etc.) and sample the finished products. Thank you to Spencer Nielsen for foraging for bay nuts, Douglas-fir and yerba buena, as well as his knowledge and assistance in wild food preparation. Many thanks to three anonymous reviewers for their helpful comments and to Victoria Jimenez for her editorial assistance. This work was funded by a grant from the American Recovery and Reinvestment Act (ARRA) provided by the USDA Forest Service and California Department of Forestry and Fire Protection (CAL FIRE).

LITERATURE CITED

- ANDLER, M. AND K. FEINSTEIN. 2011. *The Bay Area forager: your guide to edible wild plants of the San Francisco Bay Area*. The Foraging Society Press, Walnut Creek, CA.
- BAINBRIDGE, D. A. 1986. *Cooking with acorns*, draft. Dry Lands Research Institute, University of California, Riverside, CA.
- CALIFORNIA OAK MORTALITY TASK Force (COMTF). 2006. *A guide for plant gatherers: simple precautions to prevent the spread of Sudden Oak Death*. Website <http://www.suddenoakdeath.org/wp-content/uploads/2010/08/A-Guide-For-Plant-Gatherers-Simple-Precautions-to-Prevent-the-Spread-of-Sudden-Oak-Death1.pdf> [accessed 10 August 2012].
- CLAY, J. 2003. *Harvesting the wild: acorns*. Backwoods Home Magazine, Issue 79. January/February. Website <http://www.backwoodshome.com/articles2/clay79.html>. [accessed June 12, 2012].
- HEIZER, R. F. AND A. B. ELASSER. 1980. *The natural world of the California indians*. University of California Press, Berkeley, CA.
- MEDICALHEALTHGUIDE.COM. 2012. *Medical health guide: Yerba buena*. Website <http://www.medicalhealthguide.com/articles/yerbabuena.htm>. [accessed 12 June 2012].
- OCEAN, S. 2001. *Acorns and eat 'em*. Ocean-Hose, Grass Valley, CA.
- ORTIZ, B. 1991. *It will live forever*. Heyday Books, Berkeley, CA.
- PETERS, J. AND B. ORTIZ. 2010. *After the first full moon in April*. Left Coast Press, Walnut Creek, CA.
- THE LIVING WILD PROJECT. 2011. *The living wild project: a collaborative native plant community*. Website <http://www.livingwild.org/spring/douglas-fir/>. [accessed June 12, 2012].